

ARCS

Remedial Planning Activities
At Selected Uncontrolled
Hazardous Substance Disposal Sites
In The Zone of Regions VI, VII and VIII

1152335 - R8 SDMS



Environmental Protection Agency

Contract No. 68-W9-0053

**ANALYTICAL RESULTS REPORT for
SCREENING SITE INSPECTION**

**YANKTON LIGHTING and HEATING COMPANY #1
YANKTON, SOUTH DAKOTA**

Work Assignment No. 19-8JZZ

DECEMBER 11, 1995

URS

CONSULTANTS, INC.

Brown and Caldwell
Harza Environmental Services, Inc.
Shannon & Wilson, Inc.
Western Research Institute

TECHNICAL REPORT ABSTRACT

Report Title: Analytical Results Report for Focused Site Inspection
Yankton Lighting and Heating Company #1 site, Yankton, South Dakota

Report Date: December 6, 1995

Contract No.: 68-W9-0053

Prime Contractor: URS Consultants, Inc.

Work Assignment No./Delivery Order No.(if applicable): #19-8JZZ

Project Officer: Jeff Mashburn, Project Officer
Robert Heise, Work Assignment Manager

Project Officer Address: 999 18th Street, Suite 500
Denver, Colorado 80202 (303) 294-7147

Program Office: Denver, Colorado

No. of Pages in Report: 22 (Appendices A-D)

Does This Report Contain Confidential Business Information:

Yes _____ No _____ X

Report Abstract:

URS has been tasked by the U.S. Environmental Protection Agency (EPA), Region VIII to provide an Analytical Results Report (ARR) for the Focused Site Inspection (FSI) of the Yankton Lighting and Heating Company #1 site (CERCLIS ID SDD987674595) located in Yankton County, South Dakota. The ARR is designed to be used in conjunction with the URS "Field Sampling Plan for Focused Site Inspection, Yankton Lighting and Heating Company #1 site" and the "Sampling Activities Report, Yankton Lighting and Heating Company #1 site, Yankton, South Dakota".

Despite field reconnaissance and extensive historical reviews, URS has been unable to identify the specific location of the historic gas plant located near Seventh and Douglas Streets. No evidence of gas plant operations or wastes were identified during field reconnaissance. Information indicates that a coal gasification plant did operate in the vicinity of Seventh and Douglas Streets from approximately 1904 until 1907.

Source areas, if present, appear to be contained with respect to the air and soil exposure pathways. Few groundwater targets have been identified in the vicinity of the site. Sampling focused on the surface water pathway.

The only materials detected at elevated concentrations in surface water and sediment were copper and magnesium. Copper and magnesium are naturally occurring elements that could potentially be associated with coal gasification by-products or other sources.

Key Words/Descriptors:

byproducts
coal gas
coal gasification
coal tar
copper
magnesium
Marne Creek
Missouri River
Sandborn Maps
South Dakota
surface water
town gas
Yankton

**ANALYTICAL RESULTS REPORT
for SCREENING SITE INSPECTION**

**Yankton Lighting and Heating Company #1 Site
Yankton, South Dakota**

CERCLIS ID #SDD987674595

**U.S. EPA Contract No. 68-W9-0053
Work Assignment No. 19-8JZZ**

**Prepared By:
Tim Joseph**

**URS Consultants, Inc.
1099 18th Street, Suite 700
Denver, CO 80202-1907**

URS DOCUMENT CONTROL NO. 41861.53.90.B3000

Approved: _____
G. Chris Stotler, Program Manager, URS

Date: _____

Approved: _____
Tim Joseph, Project Manager, URS

Date: _____

Approved: _____
Tim Joseph, Site Investigator, URS

Date: _____

Approved: _____
Robert Heise, Site Assessment Manager, EPA

Date: _____

This document has been prepared for the U.S. Environmental Protection Agency under Contract No. 68-W9-0053. The material contained herein is not to be disclosed to, discussed with, or made available to any person or persons for any reason without prior express approval of a responsible officer of the U.S. Environmental Protection Agency. In the interest of conserving natural resources, this document is printed on recycled paper.

DISTRIBUTION LIST

ENVIRONMENTAL PROTECTION AGENCY

Robert Heise (3 copies) Work Assignment Manager/Site Assessment Manager, ARCS, EPA
Region VIII, WA #19-8JZZ

URS CONSULTANTS, INC.

Tim Joseph Project Manager, ARCS, EPA Region VIII, WA #19-8JZZ
Tim Joseph Site Investigator, ARCS, EPA Region VIII, WA #19-8JZZ
File (2 copies) ARCS, EPA Regions VI, VII and VIII

**Analytical Results Report (ARR)
for Screening Site Inspection**

**Yankton Lighting and Heating Company #1
Yankton, South Dakota**

TABLE OF CONTENTS

	<u>PAGE #</u>
SIGNATURE PAGE	i
DISTRIBUTION LIST	ii
TABLE OF CONTENTS	iii
1.0 INTRODUCTION	1
2.0 OBJECTIVES	2
3.0 BACKGROUND INFORMATION	2
3.1 Site Location and Description	
3.2 Site History and Previous Work	
3.3 Site Geology and Hydrogeology	
3.4 Site Hydrology	
3.5 Climate	
4.0 DATA VALIDATION AND INTERPRETATION	7
5.0 SOURCE CHARACTERIZATION/SOIL EXPOSURE PATHWAY	8
6.0 AIR PATHWAY	8
7.0 GROUNDWATER PATHWAY	9
8.0 SURFACE WATER PATHWAY	10
8.1 Surface Water and Sediment Sample Locations	
8.2 Surface Water and Sediment Analytical Results	
8.3 Attribution and Surface Water Targets	
9.0 SUMMARY	12
10.0 LIST OF REFERENCES	13

FIGURES

- Figure 1 Sample Location Map
Figure 2 Area of Influence Map

TABLES

- Table 1 Sample Locations and Rationale
Table 2 Surface Water Sample Results - Organic Compounds
Table 3 Surface Water Sample Results - Inorganics
Table 4 Sediment Sample Results - Organic Compounds
Table 5 Sediment Sample Results - Inorganics

APPENDICES

- Appendix A Sampling Activities Report
Appendix B Photolog
Appendix C Site Inspection Data Summary
Appendix D Validation Reports, Laboratory Data, and SQL Calculations
(Under a Separate Cover)

1.0 INTRODUCTION

URS Consultants, Inc. (URS) has been tasked by the U.S. Environmental Protection Agency (EPA), Region VIII, to provide an Analytical Results Report (ARR) for the Screening Site Inspection (SSI) of the Yankton Lighting and Heating Company #1 site (Yankton #1 site) in Yankton, Yankton County, South Dakota (CERCLIS ID# #SDD987674595). The site was investigated under the Superfund program. The Field Sampling Plan (FSP) for the Yankton #1 Site Focused Site Inspection (FSI) was approved by the Environmental Protection Agency Site Assessment Manager, Bob Heise, on March 13, 1995. Field activities at the Yankton #1 Site were conducted on June 27 and June 28, 1995, by URS. The SI field work included sampling and nonsampling data collection.

Sampling activities included the collection of 12 field samples. Specifically, five surface water, four sediment, and three quality assurance/quality control (QA/QC) samples (one trip blank, one rinsate and one surface water duplicate) were collected. Sampling procedures adhered to those delineated in the URS FSP for the Yankton #1 site and applicable URS Technical Standard Operating Procedures (TSOPs) for field operations at hazardous waste sites (URS Consultants, Inc. (URS) 1991).

The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total metals and cyanide. The samples were analyzed by contract laboratory program (CLP), routine analytical services (RAS) laboratories. The CLP laboratories selected were CompuChem Environmental Corporation in Research Triangle Park, North Carolina, for organics analysis, and Chemtech Consulting Group in Englewood, New Jersey, for inorganics analysis.

This ARR is designed to be used in conjunction with the URS documents "Field Sampling Plan for Screening Site Inspection, Yankton Lighting and Heating Company #1" (URS 1995a) and "Sampling Activities Report for the Yankton Lighting and Heating Company #1 site" (Appendix A) (URS 1995b).

2.0 OBJECTIVES

The purpose of the Site Inspection (SI) was to gather information for the evaluation of the Yankton #1 site in regard to the EPA's Hazard Ranking System (HRS) criteria (Office of the Federal Register 1990). The specific objectives of this combined SI were to:

- Assess the adequacy of containment of source areas with regard to each pathway and determine if contaminants from site source areas have been or are being released to receptor targets;
- Determine if surface water targets associated with Marne Creek have been impacted by site source areas;
- Identify the presence of additional receptor targets (e.g., wetlands, sensitive environments, residents, drinking water intakes and groundwater wells) and their distance from source areas; and
- Acquire nonsampling data (i.e., existing reports, analytical data, and physical measurements) documenting source areas, potential releases and receptor targets.

3.0 BACKGROUND INFORMATION

3.1 SITE LOCATION AND DESCRIPTION

The Yankton #1 site is located in the northwest quarter of Section 18, T. 93 N., R. 55 W. of the Yankton, South Dakota, Quadrangle (U.S. Geological Survey (USGS) 1968). The Yankton #1 facility was located on an unspecified corner of the intersection of Seventh Street and Douglas Street in Yankton, South Dakota (Figure 1) (Yankton County Historical Society 1993). Despite field reconnaissance and extensive historical reviews, URS has been unable to identify the specific location of the historic gas plant located near Seventh and Douglas Streets. The street address has not been determined because the specific site location is unknown. Sandborn Fire Insurance Maps and area topography indicate that the facility may have been at or near 618 Douglas Street (URS

1993). The house at 618 Douglas street, however, was constructed in 1875, 25 years prior to the first references of a manufactured gas plant in Yankton (City of Yankton, Registrar of Deeds Office 1995). The approximate site coordinates are 42° 52' 30" N. latitude and 97° 23' 00" W. longitude (USGS 1978).

3.2 SITE HISTORY AND PREVIOUS WORK

From 1889 until approximately 1950, gas was commonly manufactured by heating coal or coke. Gas produced by this process was stored in large metal tanks called gasometers and distributed to homes and industry through steel pipe (Radian Corporation (Radian) 1985). An article obtained from the Yankton County Historical Society which was published by Iowa Public Service Company reported a coal gasification plant in operation from approximately 1904 until 1907 at the intersection of Seventh and Douglas Streets (Yankton County Historical Society 1993). This plant was Yankton Lighting and Heating Company's first plant (Yankton #1)(CERCLIS ID# SDD987674595). In 1907, the Yankton #1 plant was forced to move due to complaints of "foul and obnoxious odors" from residents in the surrounding area. From approximately 1908 until 1938, the Yankton Lighting and Heating Company operated a water gas plant at the northeast corner of the intersection of First Street and Walnut Street (Yankton #2) (CERCLIS ID# SDD987674603). Gas production at Yankton ended in approximately 1938, when use of natural gas became more prevalent (Radian 1985).

In an effort to determine the location of Yankton Lighting and Heating Company's first facility, research was conducted at the Yankton Library by reviewing "The Yankton Press and Dakotan" newspapers dated between 1904 and 1907. Several articles were located that discussed the "old gas plant" and the "new gas plant," however, none contained the address of the old plant. The articles did, however, reveal some interesting information (The Yankton Press and Dakotan 1904-1907).

An article in the October 21, 1905, edition of the Yankton Press and Dakotan mentioned the delivery to Yankton of a large oil tank and a Tenney gas machine. The Ideal Acetylene Gas Company, which later became Yankton Lighting and Heating Company, was reportedly erecting a coal gasification plant that would use this machinery. The

plant was expected to start operations in November 1905. No articles were located that specified the location of the plant or when operations commenced. The Yankton Lighting and Heating Company #2 site gas plant reportedly opened in 1907 and used a Tenney gas machine to manufacture gas (The Yankton Press and Dakotan 1904-1907).

An article in the August 4, 1907, edition of the Yankton Press and Dakotan indicated that a company called International Heating and Lighting of Cleveland, Ohio had purchased the old Yankton Plant "some time ago" with plans to convert it to use corn cobs and straw for fuel. The article also mentions that "the old plant will soon be consigned to the junk pile." Later reports indicated that the corn cob and straw gas process proved to be un-workable (The Yankton Press and Dakotan 1904-1907).

An article in the September 9, 1907 edition of the Yankton Press and Dakotan reported that the cities of Des Moines, Omaha and Sioux City were paving some lightly traveled residential streets with coal tar. The article suggests that coal tar was being generated somewhere in Yankton and that the city of Yankton was considering various use and/or disposal options for the material (The Yankton Press and Dakotan 1904-1907).

Review of Sandborn Fire Insurance Maps from 1891, 1903, and 1912 show a vacant lot at the northwest corner of Seventh and Douglas. The maps do not show the other corners of the intersection. No additional Sandborn maps are available for the years 1904-1907, when Yankton's first gas plant was allegedly operating (Sandborn Map Company 1995).

3.3 SITE GEOLOGY AND HYDROGEOLOGY

3.3.1 Geology

The Yankton #1 site is located on Quaternary Age terrace alluvial deposits from the Missouri River. The alluvial deposits are composed of silt, clay and sand. The thickness of these deposits is approximately 20 feet. The alluvium rests upon approximately 100 feet of glacial outwash deposits. These outwash

deposits are the result of deposition from braided streams and primarily consist of interbedded coarse sands and gravels (USGS 1986).

Underlying the glacial outwash and till are approximately 800 to 1,100 feet of Cretaceous Age sediments. These include the Carlile Shale, Niobrara Formation, Greenhorn Limestone, Graneros Shale, and Dakota Sandstone. Available information suggests that the Niobrara Formation, which consists of soft, calcareous shale, may be absent in the eastern portion of Yankton due to removal by glaciation and erosion (USGS 1986). The Dakota Sandstone unconformably overlies the Precambrian Age Sioux quartzite. No faults appear to be present within four miles of the site (USGS 1960).

3.3.2 Hydrogeology

The Yankton #1 site is located on silt and sand alluvial deposits that form an alluvial aquifer. The lateral extent of the alluvial aquifer and whether the alluvial aquifer yields water in sufficient quantities for domestic or livestock purposes are not known. The alluvium along the Missouri River may be hydraulically connected with the underlying Lower James-Missouri Aquifer (USGS 1986). The Lower James-Missouri aquifer is approximately 100 feet thick and is composed of sand and gravel glacial outwash. The hydraulic gradient is from northwest to southeast. Recharge to the aquifer is from infiltration of precipitation and seepage from streams. The Lower James-Missouri Aquifer pinches out within four miles to the west of Yankton. Water from the Lower James-Missouri Aquifer is used primarily for domestic and agricultural purposes (USGS 1986).

In the vicinity of the site, the Lower James-Missouri Aquifer may be underlain by the bedrock Niobrara Aquifer. Existing information suggests that the Niobrara Aquifer may be absent in the eastern part of Yankton where the Niobrara Formation has been removed by glaciation and erosion; however, within one mile to the northwest of the site the aquifer is present (USGS 1986). The Niobrara Aquifer is under water-table conditions and may be in hydraulic

connection with the overlying James-Missouri Aquifer within one mile northwest of the site. Four miles west of the site the Niobrara Aquifer thickens to approximately 150 to 200 feet. Groundwater flow is from northwest to southeast. Water in the Niobrara Aquifer is satisfactory for domestic and livestock purposes; however, it is not extensively used (USGS 1986).

The Dakota Aquifer is separated from the overlying Niobrara Aquifer, or the Lower James-Missouri Aquifer where the Niobrara is absent, by approximately 350 to 500 feet of low permeability Cretaceous Age shale and limestone. The Dakota Aquifer is composed of interbedded siltstone, shale, and sandstone and is between 280 and 450 feet thick (USGS 1986). The hydraulic gradient is approximately 4.5 feet per mile and groundwater flow is to the northeast. Recharge to the aquifer is from underlying formations in western South Dakota, which outcrop in the Black Hills. The Dakota Aquifer is a major source of domestic, stock, and municipal water in South Dakota (USGS 1986).

3.4 SITE HYDROLOGY

The Yankton #1 site is located adjacent to Marne Creek. Runoff from precipitation at the site may infiltrate to shallow groundwater through permeable soils or enter Marne Creek via overland flow. Marne Creek discharges into the Missouri River approximately one mile downstream of the site (Figures 1 and 2) (USGS 1968). The flow rate of Marne Creek was approximately 20 cubic feet per second (cfs) during field sampling in June 1995, (URS 1995b). The Missouri River flows to the east at a rate of greater than 10,000 (cfs) (USGS 1985; USGS 1991).

3.5 CLIMATE

The Yankton #1 site is located in a moderate climate zone. The mean annual precipitation is 27.28 inches. The net annual precipitation as calculated from precipitation and evapotranspiration data (EPA Hazard Ranking System (HRS) definition) is 5.04 inches (Office of the Federal Register 1990) (University of

Delaware 1986). The 2-year, 24-hour rainfall event for this area is 2.5 inches (Dunne and Leopold 1978).

4.0 DATA VALIDATION AND INTERPRETATION

URS reviewed the Yankton #1 site data using HRS guidelines for the interpretation of analytical data (Office of the Federal Register 1990). Sample quantitation limits (SQLs) were calculated using the following equations (Appendix D):

$$SQL \text{ for inorganic aqueous samples} = CRDL \times \text{Dilution Factor}$$

$$SQL \text{ for inorganic sediment samples} = IDL \times \left(\frac{\text{Final Volume}}{\text{Sample Weight} \times \text{Percent Solids}} \right) \times \text{Dilution Factor}$$

$$SQL \text{ for organics} = \left(\frac{CRQL}{\text{Percent Solids}} \right) \times \text{Dilution Factor}$$

CRDL = Contract Required Detection Limit (inorganics)
CRQL = Contract Required Quantitation Limit (organics)
IDL = Instrument Detection Limit

As reported in analytical results tables 2 through 5, elevated concentrations of contaminants, as noted by a star (★), are determined by sample concentrations based on the following:

- If the sample concentrations are greater than or equal to three times the relevant background sample concentrations, greater than or equal to five times the blank concentrations and greater than or equal to the SQL; or
- If not detected in background or blank samples, the sample concentrations are greater than or equal to the SQL.

The starred (★) concentrations are discussed in Section 8.2 Surface Water and Sediment Analytical Results, and are referred to in the text as "elevated."

All data from sample analysis performed by the RAS laboratories were validated by EPA's Environmental Services Assistance Team (ESAT). All data are acceptable for use as qualified

in the data validation reports. Complete data validation reports, laboratory forms and SQL calculations are contained in Appendix D. Data qualifiers are also reported in the analytical results tables 2 through 5 and briefly discussed in the next paragraph. None of the analytical results for target compounds were rejected during the ESAT data validation (Appendix D).

Data from VOC and SVOC analysis of several water samples was qualified "BJ" because of calibration discrepancies. Data from VOC and SVOC analysis of several sediment samples was qualified "J" or "UJ" because of calibration discrepancies. Analysis of sediment and water for methylene chloride and bis(2-ethylhexyl)phthalate at some locations was qualified "U" due to blank contamination. Analysis for sodium in all samples was qualified "J" because of problems with the serial dilution. Calcium and zinc results in some samples was qualified "UJ" due to blank contamination. Analytical results for cyanide in all samples were qualified "UJ" because the cyanide raw data was not provided with the data package. See the Review Narrative Summaries in the data validation reports for more complete descriptions of the data qualifiers (Appendix D).

5.0 SOURCE CHARACTERIZATION/SOIL EXPOSURE PATHWAY

The specific location of the historic manufactured gas plant has not been determined. The vicinity of the site is a residential area with unrestricted access (photos 4 and 5). No evidence of the former manufactured gas facility was observed during URS' visits to the site. Source material, if present, is buried with soil and, therefore, not available to the soil exposure pathway. By-products of the coal gasification process include cyanide, ammonia and coal tar containing polynuclear aromatic hydrocarbons (PAHs) and metals (Radian 1985).

6.0 AIR PATHWAY

No air samples were collected during the SI. Contamination was not observed at the surface in the vicinity of Seventh and Douglas Streets during the Preliminary Assessment and SI site visits (URS 1993). VOCs could potentially be released if buried waste is disturbed or seeps to the surface. The nearest residents may live on site. Approximately 337 residents live within one-fourth mile of the site. The 11,762 residents of Yankton live within two miles of the site (U.S. Department of Commerce, Bureau of Census 1990). Over 100 acres of riverain and

palustrine wetlands are located within four miles of the site (U.S. Department of the Interior 1989). Sensitive environments also include habitats for the federally-listed endangered Least Tern and the federally-listed threatened Piping Plover (South Dakota Department of Game, Fish and Parks 1993b).

7.0 GROUNDWATER PATHWAY

Groundwater usage in Yankton is minimal because most residents are served by the municipal water system. Yankton uses water from the Missouri river, upstream of the confluence with Marne Creek (City of Yankton, Yankton Water Department 1993). The shallow alluvial aquifer underlying the site is hydrologically connected to the Missouri River. Well logs from wells completed in the vicinity of the site indicate that groundwater is present at approximately 15 feet below ground surface. No active domestic wells have been identified within one mile of the site. Scattered domestic, commercial, industrial and monitoring wells completed to various aquifers are reported within a four-mile radius of the site. Many of the listed wells have been closed or abandoned (South Dakota Department of Environment and Natural Resources 1993).

8.0 SURFACE WATER PATHWAY

8.1 SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

Refer to Table 1 and Figure 1 for sample locations and rationale. Background samples YTG-SW-1 and YTG-SE-1 were collected from near Yankton Middle School, approximately 300 feet upstream of Seventh and Douglas Streets (Photo 6). Samples YTG-SW-2 and YTG-SE-2, the probable point of entry (PPE) samples, were collected from Marne Creek near the intersection of Seventh and Capitol Streets. Samples YTG-SW-3 and YTG-SE-3 were collected from Marne Creek, approximately 0.3 miles downstream of Seventh and Douglas Streets (Photo 3). Sample YTG-SW-4 was collected at the confluence of Marne Creek and the Missouri River approximately 1.1 mile downstream from the PPE sample. Sample YTG-SW-4 was collected from a mixing zone between the Missouri River and Marne Creek (URS 1995b). There was no sediment present at this location due to a rocky stream bottom. Samples YTG-SW-5 and YTG-SE-5 were collected from the Missouri River upstream of the confluence with Marne Creek to characterize background conditions in the Missouri River.

8.2 SURFACE WATER AND SEDIMENT ANALYTICAL RESULTS

Surface water and sediment analytical results are reported in tables 2 through 5. No elevated concentrations of hazardous substances were detected in downgradient surface water samples. No organic compounds were detected at elevated concentrations in the downgradient sediment samples. Sample YTG-SE-3 contained elevated concentrations of copper (829 parts per million (ppm) and magnesium (28,000 ppm) (Table 5). No other elevated concentrations were detected.

8.3 ATTRIBUTION AND SURFACE WATER TARGETS

Marne Creek, near the PPE, may occasionally be used as a recreational fishery (URS 1995b). There are no wetlands present along Marne Creek within one mile downstream of the site. Near the confluence of Marne Creek and the Missouri River (1.1 miles downstream of the PPE), approximately 0.3 mile of wetlands frontage and a recreational

fishery are present along Marne Creek (URS 1995). The Missouri River is a recreational fishery lined by more than 20 miles of intermittent riverain and palustrine wetlands within 14 miles downstream of the site (U.S. Department of the Interior 1989). Sport fish indigenous to the river include carp, catfish, bass and others. The federally listed endangered Pallid Sturgeon is indigenous to the Missouri River within the 15-mile downstream segment (South Dakota Department of Game, Fish and Parks 1993). Copper and magnesium are naturally occurring elements that could potentially be associated with coal gasification by-products (Hazardous Substance Data Bank 1995). Elevated concentrations of copper and magnesium, however, were not detected in the PPE sample.

9.0 SUMMARY

Despite field reconnaissance and extensive historical reviews, URS has been unable to identify the specific location of the historic gas plant located near Seventh and Douglas Streets. No evidence of gas plant operations or wastes were identified during field reconnaissance. Information indicates that a coal gasification plant did operate in the vicinity of Seventh and Douglas Streets from approximately 1904 until 1907.

Source areas, if present, appear to be contained with respect to the air and soil exposure pathways. Few groundwater targets have been identified in the vicinity of the site. Surface water targets associated with Marne Creek include wetlands and fisheries at the confluence of Marne Creek and the Missouri River and downstream along the Missouri River.

The only materials detected at elevated concentrations in surface water and sediment were copper and magnesium. Copper and magnesium are naturally occurring elements that could potentially be associated with coal gasification by-products.

10.0 LIST OF REFERENCES

City of Yankton, Registrar of Deeds Office. 1995. Property ownership deeds for the vicinity of Seventh and Douglas Streets.

City of Yankton, Yankton Water Department. 1993. Personal communication with Jerry Busby.

Dunne, Thomas and Luna B. Leopold. 1978. "Water in Environmental Planning," W. H. Freeman and Company, San Francisco.

Hazardous Substance Data Bank. 1995. National Library of Medicine, Bethesda, Maryland (CD-ROM Version). Micromedex, Inc. Denver, Colorado.

Office of the Federal Register. 1990. National Archives and Records Administration, December 14, 1990, Code of Federal Regulations (CFR) 40, Part 300, Hazard Ranking System (HRS) for Uncontrolled Hazardous Substances Releases. Appendix A of the National Oil and Hazardous Substances Release Contingency Plan; Final Rule, pp. 55 FR51537-51667.

Radian Corporation (Radian). 1985. "Survey of Town Gas and By-Product Production and Location in the U.S.," Robert Eng, EPA Contract Number 68-02-3137.

Sandborn Map Company. 1995. Photocopies of Sandborn Fire Insurance Maps from 1891, 1903 and 1912, Yankton South Dakota.

South Dakota Department of Environment and Natural Resources, Water Rights Division. 1993. Listing of Groundwater wells.

South Dakota Department of Game, Fish and Parks (SDGFP). 1993a. Personal communication with Bob Hanten, Chief of Fisheries, November 12, 1993.

South Dakota Department of Game, Fish and Parks (SDGFP). 1993b. Rare, Threatened and Endangered Species listing provided by South Dakota Heritage Program.

U.S. Department of Commerce, Bureau of Census. 1990. "Census of Population and Housing, South Dakota."

U.S. Department of the Interior. 1989. National Wetlands Inventory Program, Wetlands Inventory Maps, Gains Point Dam, Menominee and St. Helena, Nebraska - South Dakota.

U.S. Environmental Protection Agency (EPA). 1992a. "Guidance for Performing Site Inspections Under CERCLA, Interim Final."

U.S. Environmental Protection Agency (EPA). 1992b. "Supplement to Guidance for Performing Site Inspections Under CERCLA" (September 1992).

U.S. Geological Survey (USGS). 1960. "Geology of the Yankton Area, South Dakota and Nebraska," Professional Paper 328.

U.S. Geological Survey (USGS). 1968. 7.5 Minute Topographic Map, Gavins Point Dam, South Dakota.

U.S. Geological Survey (USGS). 1978. 7.5 Minute Topographic Map, Yankton, South Dakota.

U.S. Geological Survey (USGS). 1985. 1:100,000 Scale Topographic Map, Yankton, South Dakota - Nebraska.

U.S. Geological Survey (USGS). 1986. "Water Resources of Yankton County, South Dakota," Water Resource Investigation Report 84-4241.

U.S. Geological Survey (USGS). 1991. Water-Data Report SD-91-1, "Water Resources Data for South Dakota, Water Year 1991."

University of Delaware, Center for Climatic Research. 1986. Terrestrial Water Budget Data Archive: Version 1.01, compiled by C. J. Willmott and C. M. Rowe.

URS Consultants, Inc. (URS). 1991. "Technical Standard Operating Procedures," Appendix E to the ARCS Program Management Plan, Volume IV, November 1991.

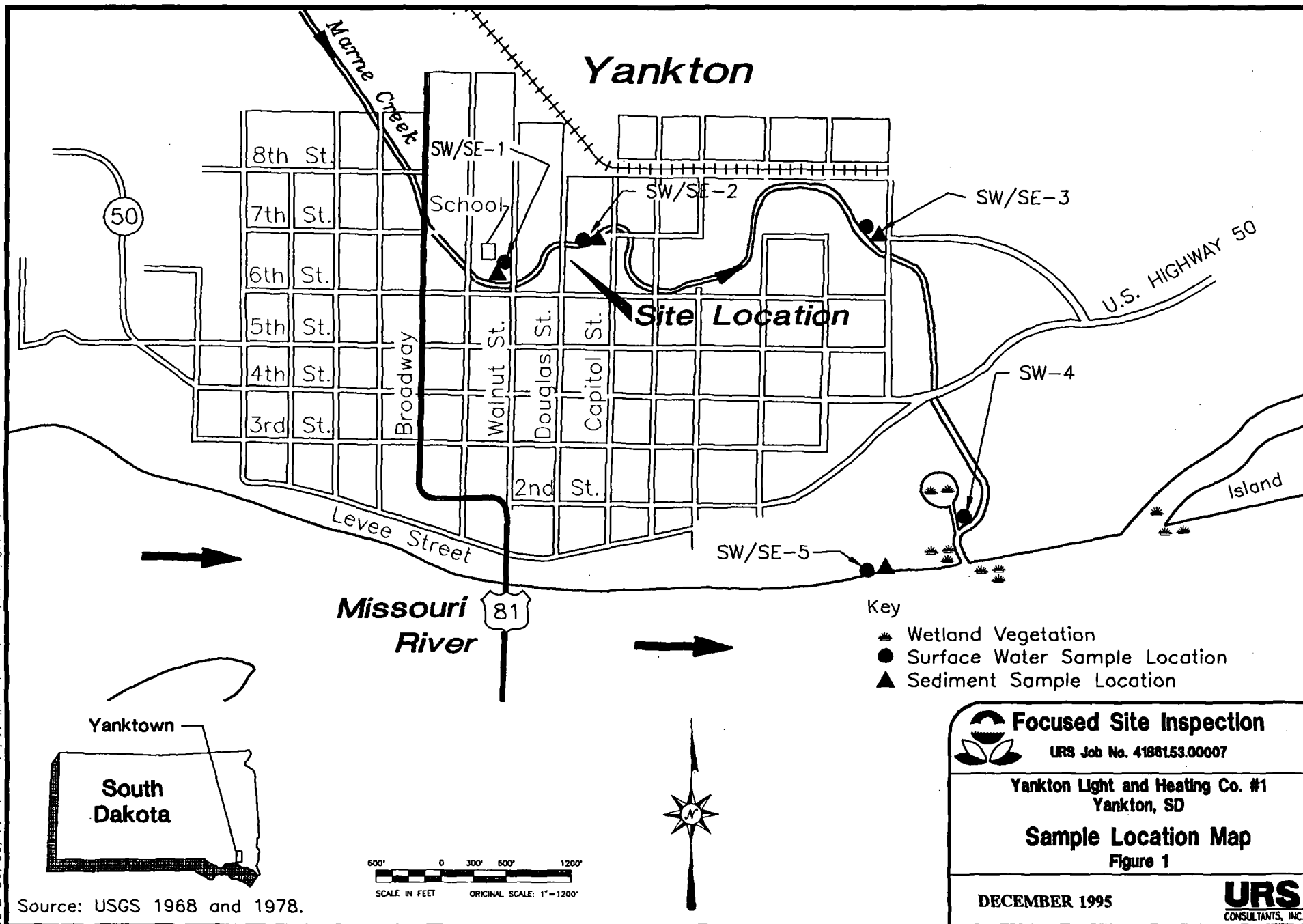
URS Consultants, Inc. (URS). 1993. Site reconnaissance conducted by Kristin Cottle and Tim Joseph on May 27, 1993.

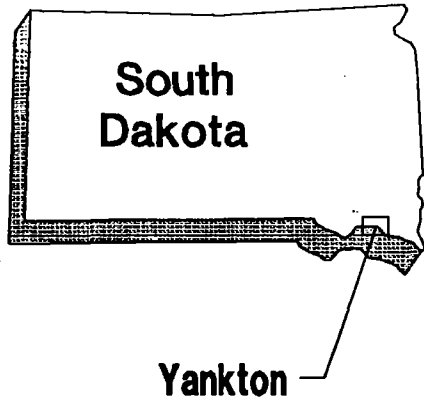
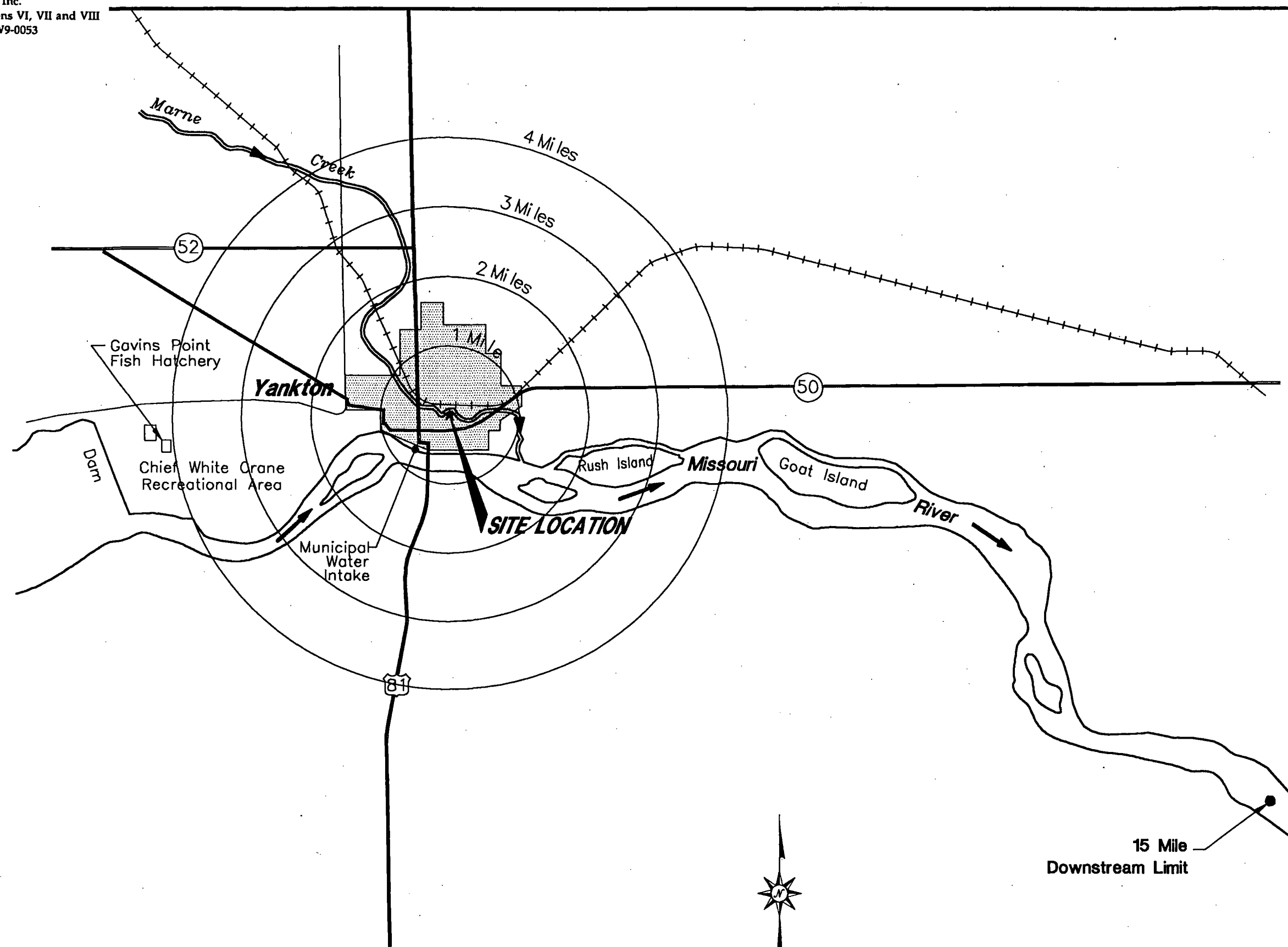
URS Consultants, Inc. 1995a. "Field Sampling Plan for Screening Site Inspection, Yankton Lighting and Heating Company #1 site, Yankton, South Dakota."

URS Consultants, Inc. 1995b. "Sampling Activities Report for the Yankton Lighting and Heating Company #1 site."

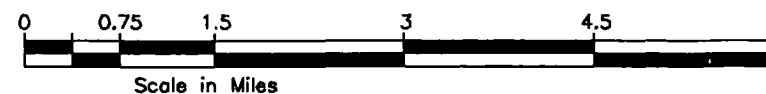
Yankton County Historical Society. 1993. Personal communication with Don Binder, Curator.

"The Yankton Press and Dakotan." 1904-1907. Review of microfiche version of the Yankton Press and Dakotan Newspaper at the Yankton City Library.





SOURCE:
USGS 30x60 Minute Topographic Quadrangle:
1:100,000 scale, South Dakota - Nebraska 1985





	Focused Site Inspection
	URS Job No. 4186153
	Yankton Lighting & Heating Co. #1 Yankton, SD
	Area of Influence Map Figure 2
DECEMBER 1995	
	

TABLE 1
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Surface Water	YTG-SW-1	Near Yankton Middle School approximately 300 feet upstream of the site.	Determine the background conditions of Marne Creek.
	YTG-SW-2	Site PPE immediately downstream of Seventh and Capitol Streets, 60' feet west of the Capitol Street Bridge.	Test for elevated concentrations of hazardous substances in Marne Creek.
	YTG-SW-3	Seventh and Burleigh Streets approximately 0.6 mile downstream of the site.	Test for elevated concentrations of hazardous substances in Marne creek.
	YTG-SW-4	Marne Creek at the confluence with the Missouri River approximately 1.1 mile downstream of the site.	Test for elevated concentrations of hazardous substances in Marne Creek wetlands area.
	YTG-SW-5	Missouri River 100 feet upstream of the confluence with Marne Creek.	Determine the background conditions of the Missouri River.
Sediment	YTG-SE-1	Near Yankton Middle School approximately 300 feet upstream of the site.	Determine the background conditions of Marne Creek.
	YTG-SE-2	Site PPE immediately downstream of Seventh and Capitol Streets, 60' feet west of the Capitol Street Bridge.	Test for elevated concentrations of hazardous substances in Marne Creek.
	YTG-SE-3	Seventh and Burleigh Streets approximately 0.6 mile downstream of the site.	Test for elevated concentrations of hazardous substances in Marne creek.
	YTG-SE-5	Missouri River 100 feet upstream of the confluence with Marne Creek.	Determine the background conditions of the Missouri River.
Quality Control	YTG-SW-10	Duplicate of YTG-SW-3.	Determine the precision of sample procedures.
	YTG-SW-11	Rinsate/Field Blank for the sediment sampling equipment.	Determine if contaminants are introduced by sample collection procedures
	YTG-SW-12	Trip Blank.	Determine if contaminants are introduced by sample handling

TABLE 2
Surface Water Sample Results - Organic Compounds
Concentrations in $\mu\text{g/l}$ (ppb)

Sample ID: Case #: Traffic Report #: Location:	YTG-SW-1 23716 HQ847 Background Marne Creek	YTG-SW-2 23716 HQ848 PPE Marne Creek	YTG-SW-3 23716 HQ849 0.6 Mile Downstream	YTG-SW-4 23716 HQ850 Confluence 1.1 Mile Downstream	YTG-SW-5 23716 HQ851 Missouri River Background	YTG-SW-10 23716 HQ856 Duplicate of YTG-SW-3	YTG-SW-12 23716 HQ858 Trip Blank
Volatile Organic Compounds							
Chloroform	-	-	-	-	-	-	25
Semivolatile Organic Compounds							
bis(2-Ethylhexyl)phthalate	-	-	-	-	-	-	-NA-
Number of SVOC TICs	0	1	1	0	1	0	-NA-

- - The analyte was not detected during analysis.
NA - Not Analyzed.
TIC - Tentatively Identified Compound.

TABLE 3
Surface Water Sample Results - Inorganics
Concentrations in $\mu\text{g/l}$ (ppb)

Sample ID: Case #: Traffic Report #: Location:	YTG-SW-1 23716 MHCK17 Background	YTG-SW-2 23716 MHCK18 PPE Marne Creek	YTG-SW-3 23716 MHCK19 0.6 Mile Downstream	YTG-SW-4 23716 MHCK20 Confluence 1.1 Mile Downstream	YTG-SW-5 23371 MHCK21 Missouri River Background	YTG-SW-10 23716 MHCK26 Duplicate of YTG-SW-3
Aluminum (Al)	[59.2]	[57.0]	[79.3]	[45.0]	[71.4]	[71.6]
Antimony (Sb)	3.0 u	3.0 u	3.0 u	[3.5]	[3.5]	3.0 u
Arsenic (As)	8.0 u	8.0 u	[9.8] (10)	8.0 u	8.0 u	8.0 u
Barium (Ba)	[46.3]	[46.5]	[49.0]	[65.7]	[58.9]	[46.7]
Beryllium (Be)	1.0 u	1.0 u	1.0 u	1.0 u	1.0 u	1.0 u
Cadmium (Cd)	2.0 u	2.0 u	2.0 u	2.0 u	2.0 u	2.0 u
Calcium (Ca)	260,000	256,000	262,000	137,000	58,300	251,000
Chromium (Cr)	5.0 u	5.0 u	5.0 u	5.0 u	5.0 u	5.0 u
Cobalt (Co)	2.0 u	2.0 u	2.0 u	2.0 u	2.0 u	2.0 u
Copper (Cu)	3.0 u	3.0 u	3.0 u	3.0 u	3.0 u	3.0 u
Iron (Fe)	30.0 u	30.0 u	30.0 u	[59.7]	[39.7]	30.0 u
Lead (Pb)	3.0 u	3.0 u	3.0 u	3.0 u	3.0 u	3.0 u
Magnesium (Mg)	98,100	97,300	99,900	47,100	22,600	95,100
Manganese (Mn)	782	764	670	1,210	56.5	643
Mercury (Hg)	0.20 u	0.20 u	0.20 u	0.20 u	0.20 u	0.20 u
Nickel (Ni)	10.0 u	10.0 u	10.0 u	10.0 u	10.0 u	10.0 u
Potassium (K)	14,500	14,700	15,000	11,900	7,670	14,000
Selenium (Se)	5.0 u	5.0 u	5.0 u	5.0 u	5.0 u	5.0 u
Silver (Ag)	3.0 u	3.0 u	3.0 u	3.0 u	3.0 u	3.0 u
Sodium (Na)	47,900 J	47,900 J	48,000 J	53,700 J	50,100 J	46,400 J
Thallium (Tl)	8.0 u	8.0 u	8.0 u	8.0 u	8.0 u	8.0 u
Vanadium (V)	[2.4]	[2.1]	[2.6]	2.0 u	[2.4]	[2.1]
Zinc (Zn)	23 UJ	22.2 UJ	28.5 UJ	32.2 UJ	67.5 UJ	26.7 UJ
Cyanide (Cn)	10.0 u	10.0 u	10.0 u	10.0 u	10.0 u	10.0 u

- [] - The analyte was detected below the CRDL, but greater than the method detection limit, therefore, the associated numerical value is an estimate. Presence of the compound is reliable. (Qualified by laboratory software.)
- u - The analyte was not detected at the reported concentration. (Qualified by laboratory software.)
- J - The associated numerical value is an estimated quantity because quality control criteria were not met.
- UJ - The analyte was not detected. The assigned numerical value is an estimate because quality control criteria were not met.
- 0 - Sample Quantitation Limit (SQL).

TABLE 4
Sediment Sample Results - Organic Compounds
Concentrations in $\mu\text{g/kg}$ (ppb)

Sample ID: Case #: Traffic Report #: Location:	YTG-SE-1 23716 HQ852 Background Marne Creek	YTG-SE-2 23716 HQ853 PPE Marne Creek	YTG-SE-3 23716 HQ854 0.6 Mile Downstream	YTG-SE-5 23716 HQ855 Missouri River Background	YTG-SW-11 23716 HQ857 Rinsate Blank
Volatile Organic Compounds					
Acetone	[5] J	-	-	-	-
Chloroform	-	-	-	-	19
Toluene	[1]	-	[3] (11.5)	-	-
Semivolatile Organic Compounds					
Phenanthrene	[100]	-	-	-	-
Fluoranthene	[160]	-	-	-	-
Pyrene	[120]	-	-	-	-
Benzo(a)anthracene	[95]	-	-	-	-
Chrysene	[73]	-	-	-	-
bis(2-Ethylhexyl)phthalate	-	-	-	-	[2]
Benzo(b)fluoranthene	[120] x NJ	-	-	-	-
Benzo(k)fluoranthene	[120] x NJ	-	-	-	-
Benzo(a)pyrene	[88]	-	-	-	-
Indeno(1,2,3-cd)pyrene	[47]	-	-	-	-
Number of SVOC TICs	10	5	4	2	0

- - The analyte was detected below the CRQL, but greater than the method detection limit, therefore, the associated numerical value is an estimate. Presence of the compound is reliable. (Qualified by laboratory software.)
- - The analyte was not detected during analysis.
- NA - Not Analyzed.
- TIC - Tentatively Identified Compound.
- 0 - Sample Quantitation Limit (SQL).
- NJ - Estimated value of a tentatively identified compound. The percent difference between the dual column quantitation was significant enough to indicate that alternative analysis may be necessary to confirm peak identity.
- x - The laboratory was unable to differentiate between these two peaks.

TABLE 5
Sediment Sample Results - Inorganics
Concentrations in mg/kg (ppm)

Sample ID: Case #: Traffic Report #: Location:		YTG-SE-01 23716 MHCK22 Background Marne Creek	YTG-SE-02 23716 MHCK23 PPE Marne Creek	YTG-SE-03 23716 MHCK24 0.6 Mile Downstream	YTG-SE-05 23716 MHCK25 Missouri River Background	YTG-SW-11 23716 MHCK27 Rinsate mg/l (ppm)
Aluminum	(Al)	9,310	1,420	1,980	1,880	0.025 u
Antimony	(Sb)	[0.82]	0.65 u	[1.0]	0.68 u	0.003 u
Arsenic	(As)	9.5	4.7	6.8	1.8 u	0.008 u
Barium	(Ba)	279	[31.4]	55.1	60.7	0.001 u
Beryllium	(Be)	[0.36]	0.22 u	0.23 u	0.23 u	0.001 u
Cadmium	(Cd)	0.52 u	0.43 u	0.47 u	0.45 u	0.002 u
Calcium	(Ca)	16,700	28,100	52,400	30,600	0.075 UJ
Chromium	(Cr)	15.4	4.9	5.4	5.4	0.005 u
Cobalt	(Co)	[7.2]	[2.5]	[2.2]	[2.6]	0.002
Copper	(Cu)	16.0	[3.6]	829 (5.81) ★	[1.4]	0.003 u
Iron	(Fe)	17,100	7,270	10,000	5,530	0.03 u
Lead	(Pb)	56.6	7.9	17.2	5.5	0.003 u
Magnesium	(Mg)	5,570	6,950	28,000 (1.86) ★	6,000	0.015 u
Manganese	(Mn)	1,040	594	1,180	1,070	0.001 u
Mercury	(Hg)	0.13 u	0.11 u	0.12 u	0.11 u	0.0002 u
Nickel	(Ni)	21.6	[6.9]	[8.3]	[8.7]	0.01 u
Potassium	(K)	1,890	[269]	[552]	[256]	0.2 u
Selenium	(Se)	1.3 u	1.1 u	1.2 u	1.1 u	0.005 u
Silver	(Ag)	0.79 u	0.65 u	0.70 u	0.68 u	0.003 u
Sodium	(Na)	[159] J	[84.3] J	[127] J	[116] J	[0.215] J
Thallium	(Tl)	2.1 u	1.7 u	1.9 u	1.8 u	0.008 u
Vanadium	(V)	31.0	[8.5]	[10.8]	[8.0]	0.002 u
Zinc	(Zn)	101	25.1	37.8	17.3	0.024
Cyanide	(Cn)	1.3 u	1.1 u	1.2 u	1.1 u	0.01 u

- - The analyte was detected below the CRDL, but greater than the method detection limit, therefore, the associated numerical value is an estimate. Presence of the compound is reliable. (Qualified by laboratory software.)
- u - The analyte was not detected at the reported concentration. (Qualified by laboratory software.)
- J - The associated numerical value is an estimated quantity because quality control criteria were not met.
- UJ - The analyte was not detected. The assigned numerical value is an estimate because quality control criteria were not met.
- 0 - Sample Quantitation Limit (SQL).
- ★ - Sample value is greater than or equal to the SQL, greater than or equal to 3x the background sample concentration and greater than or equal to 5x blank sample concentrations.

APPENDIX A
Sampling Activities Report

DRAFT



A PROFESSIONAL SERVICES ORGANIZATION

URS CONSULTANTS, INC.

1099 18TH STREET

SUITE 700

DENVER, COLORADO 80202-1907

TEL: (303) 296-9700

SAN FRANCISCO
SEATTLE
DENVER
COLORADO SPRINGS
SACRAMENTO
PORTLAND
ANCHORAGE
SAN BERNARDINO
LONG BEACH
LAS VEGAS

NEW YORK
CLEVELAND
COLUMBUS
PARAMUS
AKRON
BUFFALO
NEW ORLEANS
ATLANTA
BOSTON
VIRGINIA BEACH
PITTSBURGH

July 7, 1995

Mr. Robert Heise
Site Assessment Manager
U.S. Environmental Protection Agency
Region VIII, Waste Management Division
999 18th Street, Suite 500
Denver, Colorado 80202-2405

**SUBJECT: ARCS VI, VII and VIII, Contract No. 68-W9-0053, WA #19-8JZZ
Screening Site Inspection - Yankton Lighting and Heating Company #1 -
Yankton, South Dakota
Sample Activities Report**

Dear Mr. Heise:

The following pages contain the Sample Activities Report for the Yankton Lighting and Heating Company #1 site located in Yankton, South Dakota. This report is prepared in partial fulfillment of WAF #19-8JZZ and outlines the field sampling activities conducted on June 27 and 28, 1995.

If you have any questions, please call me at 296-9700.

Very truly yours,

URS CONSULTANTS, INC.

Barry Hayhurst
Project Manager

Tim Joseph
Site Investigator

cc: T. F. Staible/URS/Denver
ARCS File/URS/Denver

SAMPLE ACTIVITIES REPORT
for the
YANKTON LIGHTING and HEATING COMPANY #1
Yankton, South Dakota

CERCLIS ID# SDD987674595

INTRODUCTION

The Field Sampling Plan (FSP) for the Yankton Lighting and Heating Company #1 (YTG) site Focused Site Inspection (FSI) was approved by the Environmental Protection Agency Site Assessment Manager, Bob Heise, on March 13, 1995. Field activities were conducted on June 27 and June 28, 1995, by URS Consultants, Inc. (URS). The URS Field Sampling Team consisted of Tim Joseph (Field Team Leader) and Barry Hayhurst (Field Team Member). All sample locations are located in public access areas along Marne Creek. John Jonas, Chief Operator at the Yankton wastewater treatment plant, allowed the field team to gain access to Marne Creek through treatment plant property. Trish Kindt with the State of South Dakota Department of Environment and Natural Resources was notified that sampling was to occur but chose not to accompany the URS sampling team.

SAMPLING ACTIVITIES

Tables 1 and 2 and the attached chain of custody forms contain the field data, shipment information and sample locations for all samples collected during the FSI. Figure 1 depicts the sample locations. The sampling activities included the collection of 12 field samples. Specifically, five surface water, four sediment, and three quality assurance/quality control (QA/QC) samples (one trip blank, one rinsate and one duplicate) were collected.

The samples were shipped to contract laboratory program (CLP), routine analytical services (RAS) laboratories. The CLP laboratories selected were CompuChem Environmental Corporation in Research Triangle Park, North Carolina, for organics analysis, and Chemtech Consulting Group in Englewood, New Jersey, for inorganics analysis. The samples will be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total metals and cyanide. A 14-day turnaround time was requested for the laboratory analysis.

During the sampling activities, the weather was mostly sunny and breezy with an ambient air temperature ranging from approximately 65°F to 85°F.

Opportunity soil samples listed in the FSP were not collected because the specific location of potential source areas has not been identified.

SURFACE WATER SAMPLES

Surface water samples were collected from the furthest downstream to the furthest upstream location to avoid cross contamination. Sample locations are illustrated in Figure 1. FSP sample locations were slightly adjusted based on conditions encountered in the field. Samples YTG-SW-6 and YTG-SE-6 were not collected because access to this portion of the Missouri River is posted. Sample YTG-SW-5 was collected from a wetland area approximately one mile downstream of YTG. Sample YTG-SE-5 was not collected because no sediment was detected in Marne Creek near this location. The U.S. Army Corps of Engineers has constructed a riprap blanket at the confluence of Marne Creek and the Missouri River covering sediment with several layers of one- to two-foot diameter rocks. All other samples were collected as specified in the FSP. The discharge rate of Marne Creek was approximately five to ten cubic foot per second during sampling activities. Wetlands vegetation is present near the Missouri River in Marne Creek. The surface water samples were collected by immersing the sample jar directly into the creek. Temperature, conductivity and pH measurements were taken for each sample by the field team using a Hydak CPT meter (Table 1).

SEDIMENT SAMPLES

Sediment samples were collected in conjunction with each surface water sample. Sediment samples were collected using a decontaminated stainless steel spoon and bowl. Sediment was scooped into a stainless steel bowl and mixed (except the VOC fraction) and then placed in the appropriate sample containers.

QUALITY ASSURANCE SAMPLES

Three quality control samples were collected during the FSI. One trip blank (sample YTG-SW-12) and one rinsate sample YTG-SW-11 for the sediment sampling equipment were collected. Duplicate sample YTG-SW-10 was collected with surface water sample YTG-SW-3. Matrix spike/matrix spike duplicate (MS/MSD) volumes were also collected at sampling location YTG-SW-3.

FIELD OBSERVATIONS

Despite field reconnaissance and extensive historical reviews, URS has been unable to identify the specific location of the historic gas plant located near Seventh and Douglas Streets.

Potential sources of environmental contamination near the site include railroad operations and urban runoff. Miscellaneous debris, including a discarded gas can, were observed in Marne Creek. The sediment of Marne Creek contains a great deal of trash such as glass, wire, nails, plastic, bricks, etc.

John Jonas mentioned that the original route of Marne Creek to the Missouri River had been altered near the water treatment plant. The old channel remains open to the Missouri river and is used as a wetland/breeding area by fish species including carp. Because of high water in the Missouri River, Marne Creek was backed up approximately one tenth of a mile.

No sheen or other evidence of contamination was observed in Marne Creek or in the vicinity of Seventh and Douglas Streets. A large quantity of old bricks is present in Marne Creek near Seventh and Douglas Streets. No groundwater seeps were observed near Seventh and Douglas Streets.

Approximately one-tenth mile of wetlands vegetation frontage is present along Marne Creek near the water treatment plant approximately one mile downstream of the site. A fishing pole was observed lying near Marne Creek near the PPE. Several large fish were observed in Marne Creek, but it is unknown which fish species are present in Marne Creek.

Groundwater use in the vicinity of the site is believed to be minimal. No nearby groundwater wells have been located during field activities.

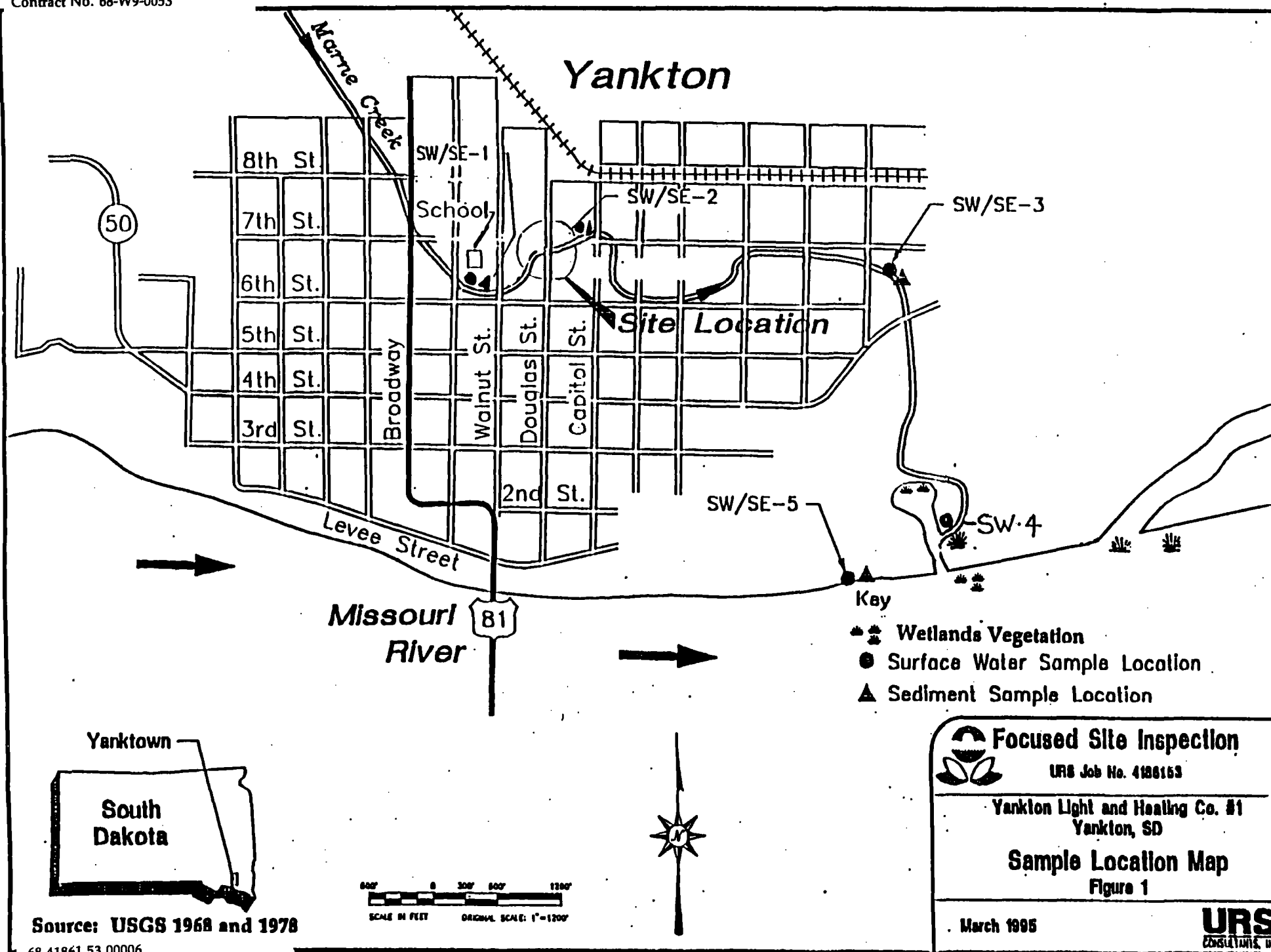


TABLE 1
MARNE CREEK AND QA/QC FIELD DATA
Yankton Lighting and Heating Company #1

Sample ID	Sampling		Shipping Date	Field Data			Sample Location
	Date	Time		pH	Cond. $\mu\text{S}/\text{cm}^3$	Temp. $^{\circ}\text{F}$	
YTG-SW-1	6/27/95	1430	6/28/95	7.32	1,922	71	Background sample to characterize Marne Creek
YTG-SW-2	6/27/95	1345	6/28/95	7.6	1,934	73	Marne Creek at the PPE just east of Capitol Street
YTG-SW-3	6/27/95	1240	6/28/95	7.68	1,840	71	Marne Creek approximately 0.1 mile downstream - MS/MSD volume
YTG-SW-4	6/27/95	1010	6/28/95	6.24	1,280	71	Marne Creek approximately 1.0 mile downstream (Wetland)
YTG-SW-5	6/27/95	1105	6/28/95	7.10	778	75	Background sample to characterize the Missouri River
YTG-SW-10	6/27/95	1240	6/28/95	7.68	1,840	71	Duplicate of YTG SW-03
YTG-SW-11	6/27/95	1335	6/28/95	--	--	--	Rinsate - Sediment Sampling Equipment
YTG-SW-12	6/27/95	0835	6/28/95	--	--	--	Trip Blank

YTG Yankton Lighting and Heating Company #1
 SW Surface Water
 PPE Probable Point of Entry
 MS/MSD Matrix Spike / Matrix Spike Duplicate (Laboratory quality control samples)

TABLE 2
SEDIMENT FIELD DATA
Yankton Lighting and Heating Company #1

Sample ID	Sampling		Shipping Date	Sample Location
	Date	Time		
YTG-SE-1	6/27/95	1430	6/28/95	Background sample to characterize Marne Creek
YTG-SE-2	6/27/95	1345	6/28/95	Marne Creek at the PPE - just east of Capitol Street
YTG-SE-3	6/27/95	1240	6/28/95	Marne Creek approximately 0.1 mile downstream - MS/MSD Volume
YTG-SE-4	--	--	--	Not collected - No sediment is present in this portion of Marne Creek
YTG-SE-5	6/27/95	1105	6/28/95	Background sample to characterize the Missouri River

YTG Yankton Lighting and Heating Company #1
SE Sediment
PPE Probable Point of Entry
MS/MSD Matrix Spike / Matrix Spike Duplicate (Laboratory quality control samples)

APPENDIX B

Photolog

DRAFT

PHOTO 1

Wetlands located near sample location YTG-SW-4 at the confluence of Marne Creek and the Missouri River.



PHOTO 2

Tim Joseph, URS, collecting the background sample from the Missouri River.

PHOTO 3

Barry Hayhurst, URS, collecting sample YTG-SW/SE-3 from the Marne Creek.



PHOTO 4

View to the west of vacant area near the northwest corner of Seventh and Capitol Streets.

PHOTO 5

View to the west of vacant area near the northeast corner of Seventh and Douglas Streets.



PHOTO 6

Tim Joseph collecting the background samples from Marne Creek.



68-41861.53.00007

\\SI\\Sites\\Yankton\\ARR\\Photolog:em

APPENDIX C

Site Inspection Data Summary

DRAFT

SI Data Summary

Site Name Yankton Lighting and Heating #1
(Yankton #1)Site Name Yankton #1EPA Region VIII Date 11/95

Contractor Name or State Office and Address

URS Consultants, Inc.1099 18th Street, Suite 700, Denver, CO 80202**GENERAL SITE INFORMATION**1. CERCLIS ID No. SDD 487674595Address Vicinity of Seventh and Douglas City YanktonCounty Yankton State SD Zip Code 57078 Congressional District _____2. Owner name UnknownOperator name Unknown

Owner address _____

Operator address _____

City _____ State _____

City _____ State _____

3. Type of ownership (check all that apply):

☒ Private ☐ Federal/Agency ☐ State ☐ County ☐ Municipal☐ Other _____Reference(s) URS 19934. Approximate size of property: 1 acresReference(s) URS 19935. Latitude 42° 52' 30" Longitude 97° 23' 00"Reference(s) USGS 19786. Site status: ☐ Active ☒ Inactive ☐ UnknownReference(s) URS 19937. Years of operation: From: 1904 to: 1907 ☐ UnknownReference(s) Yankton County
Historical Society
1993

8. Previous Investigations:

Type	Agency/State/Contractor	Date
<u>PA</u>	<u>URS Consultants, Inc.</u>	<u>1993</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Reference(s) URS 1995a

Reference(s) _____

Reference(s) _____

Reference(s) _____

Reference(s) _____

Reference(s) _____

WASTE SOURCE INFORMATION

1. Waste source types (check all that apply)

- ☐ Constituent
- ☐ Wastestream (type) _____
- ☐ Landfill
- ☐ Drums
- ☐ Contaminated soil
- ☐ Land treatment
- ☐ Tanks or non-drum containers (type) _____
- ☐ Pile (type) _____
- ☐ Surface impoundment (buried)
- ☒ Surface impoundment (backfilled) Potential
- ☐ Other _____

Reference(s) Radian 1985

2. Types of wastes (check all that apply)

- ☐ Organic chemicals
- ☐ Inorganic chemicals
- ☐ Municipal wastes
- ☐ Radionuclides
- ☐ Metals
- ☐ Pesticides/Herbicides
- ☐ Solvents
- ☒ Other Coal Tar, SVOCs, CN⁻

Reference(s) _____

3. Summarize history of waste disposal operations:

Unknown - Historical coal gasification plant.Reference(s) Radian 1985

SI Data Summary

Site Name Yankton

4. Source characterization (Attach pages to show quantity and calculations.)

Source 1 name: Potential Coal Gasification Waste Source type Surface Impoundment

Describe source: _____

Ground water migration containment: NONESurface water migration containment: Buried, BackfilledAir migration (gas and migration) containment: Buried, BackfilledPhysical state of wastes: ☐ Liquid ☐ Solid ☐ Sludge/Slurry ☐ Gas ☒ Unknown

Constituent quantity of hazardous substances: _____ (specify units)

Wastestream quantity containing hazardous substances: _____ (specify units)

Volume of source (yd³): Unknown Area of source (ft²): _____

Hazardous substances associated with source 1:

<u>SVOCs</u>	<u>Metals</u>	<u>CN⁻</u>
_____	_____	_____
_____	_____	_____

Reference(s) Radia 1985

Source 2 name: _____ Source type _____

Describe source: _____

Ground water migration containment: _____

Surface water migration containment: _____

Air migration (gas and migration) containment: _____

Physical state of wastes: ☐ Liquid ☐ Solid ☐ Sludge/Slurry ☐ Gas ☐ Unknown

Constituent quantity of hazardous substances: _____ (specify units)

Wastestream quantity containing hazardous substances: _____ (specify units)

Volume of source (yd³): _____ Area of Source (ft²): _____

Hazardous substances associated with source 2:

_____	_____	_____
_____	_____	_____
_____	_____	_____

Reference(s) _____

SI Data Summary

Site Name Yankton #1

CONTINUATION PAGE FOR SOURCE CHARACTERIZATION

Source # _____ Name _____ Source type _____

Describe source: _____

Ground water migration containment: _____

Surface water migration containment: _____

Air migration (gas and migration) containment: _____

Physical state of wastes: ☐ Liquid ☐ Solid ☐ Sludge/Slurry ☐ Gas ☐ Unknown

Constituent quantity of hazardous substances: _____ (specify units)

Wastestream quantity containing hazardous substances: _____ (specify units)

Volume of source (yd³): _____ Area of source (ft²): _____

Hazardous substances associated with source # _____:

_____	_____	_____
_____	_____	_____
_____	_____	_____

Reference(s) _____

Source # _____ Name _____ Source type _____

Describe source: _____

Ground water migration containment: _____

Surface water migration containment: _____

Air migration (gas and migration) containment: _____

Physical state of wastes: ☐ Liquid ☐ Solid ☐ Sludge/Slurry ☐ Gas ☐ Unknown

Constituent quantity of hazardous substances: _____ (specify units)

Wastestream quantity containing hazardous substances: _____ (specify units)

Volume of source (yd³): _____ Area of source (ft²): _____

Hazardous substances associated with source # _____:

_____	_____	_____
_____	_____	_____
_____	_____	_____

Reference(s) _____

SI Data Summary

Site Name

Yankton #1

5. Description of removal or remedial activities

If a removal has occurred, identify the removal authority and describe the activities. Specify the date(s) of the removal.

NONE Identified

Reference(s)

GROUND WATER INFORMATION

1. Ground water drinking water use within 4 miles of site sources:

☐ Municipal ☒ Private ☐ Both ☐ No Drinking Water UseReference(s) SDDENR 1993

2. Is ground water contaminated?

☐ Yes ☐ No ☐ Uncertain but likely ☒ Uncertain but not likely☐ Additional sampling requiredIs analytical evidence available? ☐ Yes ☒ NoReference(s) URS 1995a

3. Is ground water contamination attributable to the site?

☐ Yes ☐ No ☐ Additional sampling requiredReference(s) NA

4. Are drinking water wells contaminated?

☐ Yes ☐ No ☐ Uncertain but likely ☒ Uncertain but not likely☐ Additional sampling requiredIs analytical evidence available? ☐ Yes ☒ NoReference(s) URS 1995a5. Net precipitation (HRS Section 3.1.2.2): 5 inchesReference(s) UoFD 19866. County average number of persons per residence: 2.8Reference(s) USDOC 1990

7. Discuss general stratigraphy underlying the site. Attach sketch of stratigraphic column.

See Table GW-1Reference(s) _____

8. Using Table GW-1 (next page), summarize geology underlying the site (starting with formation #1 as closest to ground surface). Indicate if formation is interconnected with overlying formation.

SI Data Summary

Site Name Yankton #1

TABLE GW-1: SITE GEOLOGY

NAME OF FORMATION	INTER-CONNECT? (yes/no)	TYPE OF MATERIAL	AVERAGE THICKNESS (FEET)	HYDRAULIC CONDUCTIVITY (CM/SEC)	USED FOR DRINKING WATER?
1. Alluvium	Yes		20	10^{-4}	Y
2. Glacial Outwash	Yes		100	10^{-4}	Y
3. Cretaceous Sed.	Yes		1000	10^{-4}	Y
4.					
5.					
6.					

Reference(s) USGS 1986 OFR 1990

9. Does a karst aquifer underlie any site source?

☐ Yes ☒ NoReference(s) USGS 198610. Depth to top of aquifer: ^{Unknown} 20 feet Elevation: 1180 Reference(s) USGS 1978

11. In the table below, enter the number of people obtaining drinking water from wells located within 4 miles of the site. For each aquifer, attach population calculation sheets. Key aquifer to formations listed in Table GW-1.

Unknown

POPULATION SERVED BY WELLS WITHIN DISTANCE CATEGORIES BY AQUIFER

DISTANCE OF WELL(S) FROM SITE SOURCES	AQUIFER A: INCLUDES FORMATIONS _____	AQUIFER B: INCLUDES FORMATIONS _____	AQUIFER C: INCLUDES FORMATIONS _____
1/4 mile or less			
>1/4 to 1/2 mile			
>1/2 to 1 mile			
>1 to 2 miles			
>2 to 3 miles			
>3 to 4 miles			

Reference(s) _____

12. Is ground water from multiple wells blended prior to distribution?

☐ Yes ☒ No

Reference(s) _____

NA

SI Data Summary

Site Name Yankton #1

13. Is ground water blended with surface water?

☐ Yes ☒ No

Reference(s) Yankton Water Dept. 1993

Briefly describe: _____

14. Distance from any incompletely contained source available to ground water to nearest drinking water well (HRS Section 3.3.1): > 5000 feet

Reference(s) SDDENR 1993

15. Briefly describe standby drinking water wells within 4 miles of sources at the site:

NONE Identified

Reference(s) _____

16. Using Table GW-2, summarize ground water analytical results for all sampling investigations. Include and identify background ground water sample results.

17.* Ground water resources within 4 miles of site sources (HRS Section 3.3.3):

- ☒ Irrigation (5-acre minimum) of commercial food or commercial forage crops
- ☐ Commercial livestock watering
- ☐ Ingredient in commercial food preparation
- ☐ Supply for commercial aquaculture
- ☒ Supply for major or designated water recreation area, excluding drinking water use
- ☐ Water usable for drinking water but no drinking water wells are within 4 miles
- ☐ None of the above

Reference(s) USGS 1978; Yankton Water Dept. 1993

18. Wellhead protection area (WHPA) within 4 miles of site sources (HRS Section 3.3.4):

- ☐ Source with non-zero containment factor value lies within or above WHPA
- ☐ Observed ground water contamination attributable to site source(s) lies within WHPA
- ☐ WHPA lies within 4 miles of site sources
- ☒ None

Reference(s) _____

Additional ground water pathway description:

References(s) _____

TABLE GW-2: ANALYTICAL RESULTS FOR GROUND WATER PATHWAY

No groundwater samples have been collected.

SAMPLE ID & DATE	TYPE OF WELL	SCREENED INTERVAL	HAZARDOUS SUBSTANCE	CONCENTRATION (SPECIFY UNITS)	DETECTION LIMIT	REFERENCES
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					
	<input type="checkbox"/> Irrigation <input type="checkbox"/> Monitoring <input type="checkbox"/> Drinking water People served _____ <input type="checkbox"/> Other _____					

SURFACE WATER INFORMATION

Complete this section of the data summary for each watershed if there are multiple watersheds. Photocopy this page if necessary.

1. Describe surface water migration path from site sources to at least 15 miles downstream. Attach a sketch of the surface water migration route.

Marne Creek flows southeast to the Missouri River

Missouri River to 15+ Miles downstream.

Reference(s) URS 1995

2. Is surface water contaminated?

☐ Yes ☐ No ☐ Uncertain but likely ☒ Uncertain but not likely ☐ Additional sampling required
Is analytical evidence available? ☒ Yes ☐ No Reference(s) URS 1995b

3. Is surface water contamination attributable to the site?

☐ Yes ☒ No ☐ Additional sampling required Reference(s) URS 1995b

4. Floodplain category in which site sources are located (check all that apply): Unknown Location

☐ 1-year ☒ 10-year ☐ 100-year ☐ 500-year ☐ None

Reference(s) _____

5. Describe flood containment for each source (HRS Section 4.1.2.1.2.2):

Unknown
Source #1 _____ Flood containment _____
Source #2 _____ Flood containment _____
Source #3 _____ Flood containment _____
Source # _____ Flood containment _____
Source # _____ Flood containment _____
Source # _____ Flood containment _____
Source # _____ Flood containment _____

Reference(s) _____

6. Shortest overland distance to surface water from any source (HRS Section 4.1.2.1.2.1.3):

_____ feet Unknown

Reference(s) _____

7. Size of drainage area (HRS Section 4.4.3): _____ Acres

Reference(s) _____

Unknown

SI Data Summary

Site Name Yankton #1

8.* Describe predominant soil group within the drainage area (HRS Section 4.1.2.1.2.1.2).

Reference(s) _____

9.* 2-year 24-hour rainfall (HRS Section 4.1.2.1.2.1.2):

2.5 inchesReference(s) Dunne and Leopold

10.* Elevation of the bottom of nearest surface water body:

1200 feet above sea levelReference(s) USGS 1978

11.* Elevation of top of uppermost aquifer:

1180 feet above sea levelEstimate

Reference(s) _____

12. Predominant type of water body between probable point of entry to surface water and nearest drinking water intake:

☐ River ☐ LakeNA

Reference(s) _____

13. Identify all drinking water intakes, fisheries, and sensitive environments within 15 miles downstream.

TARGET NAME/TYPE	WATER BODY TYPE	DISTANCE FROM PPE	FLOW (CFS)	TARGET CHARACTERISTICS ¹	TARGET SAMPLED?
Fishery	Stream	1	~ 20	Unknown > 1 lb	Yes
Wetland	Stream	1	~ 20	0.3 Frontage Miles	Yes
Fishery	Stream	> 1.1	10,000	Unknown > 1 lb	No
Wetland	Stream	> 1.1	10,000	20 Frontage Miles ²	No
Endangered Species	Stream	> 1.1	10,000	Fed-listed Palat	No
				Sturgeon	

¹If target is a drinking water intake, provide number of people served by intake.

If target is a fishery, provide species and annual production of human food chain organisms (pounds per year).

If target is a wetland, specify wetland frontage (in miles). Attach calculation pages.

Reference(s)

URS 1995

14. Is surface water drinking water blended prior to distribution?

☐ Yes ☐ NoNA

Reference(s) _____

SI Data Summary

Site Name Yankton #1

15. Describe any standby drinking water intakes within 15 miles downstream.

NONE Identified

Reference(s) _____

16. *Surface water resources within 15 miles downstream (HRS Section 4.1.2.3.3):

- ☒ Irrigation (5-acre minimum) of commercial food or commercial forage crops
- ☒ Commercial livestock watering
- ☐ Ingredient in commercial food preparation
- ☒ Major or designated water recreation area, excluding drinking water use
- ☐ Water designated by the state for drinking water use but is not currently used
- ☒ Water usable for drinking water but no drinking water intakes within 15 miles downstream
- ☐ None of the above

Reference(s) _____

URS 1995a USGS 1986

17. Using Table SW-1, summarize surface water analytical results for all sampling investigations. Include and identify background sample results.

TABLE SW-1: SUMMARY OF ANALYTICAL RESULTS FOR SURFACE WATER PATHWAY

See Tables 2-5 in the ARR Text.

SAMPLE ID & DATE	SAMPLE TYPE	SAMPLE OBJECTIVE	TARGET NAME	HAZARDOUS SUBSTANCE	CONCENTRATION (SPECIFY UNITS)	DETECTION LIMIT	REFERENCES
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					
	<input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Other	<input type="checkbox"/> Release <input type="checkbox"/> Fishery <input type="checkbox"/> Drinking water <input type="checkbox"/> Sensitive environment Distance from PPE					

SOIL INFORMATION

1. Is surficial or soil contamination present at the site?

☐ Yes ☐ No ☐ Uncertain but likely ☒ Uncertain but not likely☐ Additional sampling requiredIs analytical evidence available? ☐ Yes ☒ NoReference(s) URS 1993
URS 1995b

2. Is surficial or soil contamination attributable to the site?

☐ Yes ☐ No ☐ Additional sampling requiredNA

3. Is surficial contamination on the property and within 200 feet of a residence, school, daycare center, or workplace?
- IF Contamination is present, it is likely within 200 feet

☐ Yes ☐ No ☐ Uncertain but likely ☐ Uncertain but not likely of a residence.☐ Additional sampling requiredIs analytical evidence available? ☐ Yes ☒ NoReference(s) URS 1993

- 4.* Total area of surficial contamination (HRS Section 5.2.1.2):

 square feetNA
Reference(s)

- 5.* Attractiveness/accessibility of the areas of observed contamination (HRS Section 5.2.1.1). Check all that apply:

☐ Designated recreational area☐ Used regularly, or accessible and unique recreational area☒ Moderately accessible with some use☐ Slightly accessible with some use☐ Accessible with no use☐ Inaccessible with some use☐ Inaccessible with no use

Reference(s)

URS 1995a

6. Using Table SE-1, summarize analytical results detecting surficial contamination within 200 feet of a residence, school, daycare center, or workplace. Include and identify background sample results.
7. Using Table SE-2, summarize analytical results detecting surficial contamination within the boundary of a resource or a terrestrial sensitive environment. Include and identify background sample results if not listed in Table SE-1.
8. Population within 1-mile travel distance from site. Do not include populations from Table SE-1.

DISTANCE FROM SITE SOURCES	POPULATION
1/4 mile or less	337
>1/4 to 1/2 mile	1,000
>1/2 to 1 mile	4,000

Reference(s)

USDOC 1990

TABLE SE-1: ANALYTICAL RESULTS FOR SOIL EXPOSURE PATHWAY

No soil samplers have been collected

SAMPLE ID & DATE	SAMPLE DEPTH	TYPE OF PROPERTY	POPULATION	HAZARDOUS SUBSTANCE	CONCENTRATION (SPECIFY UNITS)	DETECTION LIMIT	REFERENCES
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					
		<input type="checkbox"/> Residence <input type="checkbox"/> School <input type="checkbox"/> Daycare center <input type="checkbox"/> Workplace					

TABLE SE-2: ANALYTICAL RESULTS FOR SOIL EXPOSURE PATHWAY

No soil samples have been collected

SAMPLE ID & DATE	SAMPLE DEPTH	TYPE OF TARGET	HAZARDOUS SUBSTANCE	CONCENTRATION (SPECIFY UNITS)	DETECTION LIMIT	REFERENCES
		<input type="checkbox"/> Terrestrial sensitive environment <input type="checkbox"/> Resources* <input type="checkbox"/> Commercial agriculture <input type="checkbox"/> Commercial silviculture <input type="checkbox"/> Commercial livestock production or grazing				
		<input type="checkbox"/> Terrestrial sensitive environment <input type="checkbox"/> Resources* <input type="checkbox"/> Commercial agriculture <input type="checkbox"/> Commercial silviculture <input type="checkbox"/> Commercial livestock production or grazing				
		<input type="checkbox"/> Terrestrial sensitive environment <input type="checkbox"/> Resources* <input type="checkbox"/> Commercial agriculture <input type="checkbox"/> Commercial silviculture <input type="checkbox"/> Commercial livestock production or grazing				
		<input type="checkbox"/> Terrestrial sensitive environment <input type="checkbox"/> Resources* <input type="checkbox"/> Commercial agriculture <input type="checkbox"/> Commercial silviculture <input type="checkbox"/> Commercial livestock production or grazing				

SI Data Summary

Site Name Yankton #1**AIR INFORMATION**

1. Is air contamination present at the site?

☐ Yes ☐ No ☐ Uncertain but likely ☒ Uncertain but not likely☐ Additional sampling requiredIs analytical evidence available? ☐ Yes ☒ NoReference(s) URS 1993
URS 1995b

2. Is air contamination attributable to the site?

☐ Yes ☐ No ☐ Additional sampling requiredNA

3. Are populations, sensitive environments, or wetlands exposed to airborne hazardous substances released from the site?

☐ Yes ☐ No ☐ Uncertain but likely ☒ Uncertain but not likely☐ Additional sampling requiredIs analytical evidence available? ☐ Yes ☒ NoReference(s) URS 1995a

4. Evidence of biogas release from any of the following source types at the site:

☐ Below-ground containers or tanks ☐ Landfill ☐ Buried surface impoundmentReference(s) No5.* Particulate migration potential factor value: 11 (HRS Figure 6-2)6.* Particulate mobility factor value: .0008 (HRS Figure 6-3)

7. Distance from any incompletely contained source to nearest residence or regularly occupied area: _____ miles Reference(s) _____

8. Population within 4 miles of site sources.

Unknown

DISTANCE FROM SITE SOURCES	POPULATION
0 (within site sources)	<u>Unknown</u>
1/4 mile or less	<u>337</u>
>1/4 to 1/2 mile	<u>1,000</u>
>1/2 to 1 mile	<u>4,000</u>
>1 to 2 miles	<u>4,000</u>
>2 to 3 miles	<u>600</u>
>3 to 4 miles	<u>840</u>

Reference(s) USDOC 1990

9.* Resources within 1/2 mile of site sources (HRS Section 6.3.3):

☐ Commercial agriculture☐ Commercial silviculture☐ Major or designated recreation area☒ None of the aboveReference(s) URS 1993, 1995b

SI Data Summary

Site Name Yankton #1

10. Sensitive environments and wetlands within 4 miles of the site.

NAME/DESCRIPTION/LOCATION OF SENSITIVE ENVIRONMENT OR WETLAND	DISTANCE FROM SITE (MILES)	TYPE OF SENSITIVE ENVIRONMENT	WETLAND SIZE (ACRES)
Endangered Species	1/4	Least Tern	-NA-
Wetlands	1	Wetlands	7100 Acres

Reference(s) SDDGFP 1993, USDOE 1989

11. Using Table Air-1, summarize air analytical results for all sampling investigations. Include and identify background sample results.

TABLE AIR-1: SUMMARY OF ANALYTICAL RESULTS FOR AIR PATHWAY

No air samples have been collected

SAMPLE ID & DATE	SAMPLE TYPE	DISTANCE FROM SITE (MILES)	TARGET(S) WITHIN DISTANCE CATEGORY	HAZARDOUS SUBSTANCE	CONCENTRATION (SPECIFY UNITS)	DETECTION LIMIT	REFERENCES
			<input type="checkbox"/> Number of people _____ <input type="checkbox"/> Name of sens. environment _____ <input type="checkbox"/> Wetland acreage _____				
			<input type="checkbox"/> Number of people _____ <input type="checkbox"/> Name of sens. environment _____ <input type="checkbox"/> Wetland acreage _____				
			<input type="checkbox"/> Number of people _____ <input type="checkbox"/> Name of sens. environment _____ <input type="checkbox"/> Wetland acreage _____				
			<input type="checkbox"/> Number of people _____ <input type="checkbox"/> Name of sens. environment _____ <input type="checkbox"/> Wetland acreage _____				
			<input type="checkbox"/> Number of people _____ <input type="checkbox"/> Name of sens. environment _____ <input type="checkbox"/> Wetland acreage _____				
			<input type="checkbox"/> Number of people _____ <input type="checkbox"/> Name of sens. environment _____ <input type="checkbox"/> Wetland acreage _____				
			<input type="checkbox"/> Number of people _____ <input type="checkbox"/> Name of sens. environment _____ <input type="checkbox"/> Wetland acreage _____				

SI Data Summary

Site Name Yankton #1

ADDITIONAL INFORMATION AND COMMENTS

Reference(s) _____

APPENDIX D

**Validation Reports, Laboratory Data and SQI Calculations
(under separate cover)**

DRAFT